

Appln. No. 09/955,857
Amdt. dated September 12, 2003
Reply to Office Action of May 12, 2003

Amendments to the Claims:

Please cancel claims 2 and 11 without prejudice and amend claims 1, 3, 10 and 12-17 as follows. The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended). An inverted microscope comprising:

B3 an image output port that forms an image of an observation sample to ~~the~~ an external surface of a microscope main body and is provided at ~~facing to~~ an observer side and a, ~~at the front~~ side of ~~a~~ the microscope main body, and below an observation a lens tube to which eyepieces are attached, wherein:

one of a photographing device ~~devices configured that~~ ~~one of at least two kinds of~~ photographing devices, a TV camera and a digital camera device is selectively coupled/decoupled ~~attachable/detachable~~ to the image output port,

first, second and third photograping lens units each having different photographing magnifications for the

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photographing device, the TV camera and the digital camera device, respectively, and

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when attaching one of the photographing device, the TV camera and the digital camera device to the image output port, a photographing lens unit corresponding to one of the photographing device, the TV camera, and the digital camera device is set to the image output port among the first, second and third photographing lens units.

Claim 2 (Cancelled).

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Claim 3 (Currently Amended). ~~An~~ The inverted microscope according to claim 2 1, ~~further comprising plural wherein at least one of the first, second and third photographing lens units has two or more photographing lens units each having different photographing magnifications respectively in accordance with the photographing device, the digital camera device, and the TV camera,~~
~~and one of the plural photographing lens units is assembled therein according to the kind of the photographing device, the TV camera, and the digital camera device.~~

Claim 4-9 (Cancelled).

Claim 10 (Currently Amended). An inverted microscope
~~according to claim 1, comprising:~~

an image output port that forms an image of an observation
sample to an external surface of a microscope main body, an
observer side and a front side of the microscope main body, and
below a lens tube to which eyepieces are attached, wherein:

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~~the at least two kinds one of photographing devices
include: a photographing device that exposes and forms the
image of the observation sample onto a film surface
thereof; a TV camera that photographs the image of the
observation sample by a photographing element thereof and
outputs image data thereof; and a digital camera device
that photographs the image of the observation sample and
can record the image data as a still image into a recording
medium. is selectively coupled/decoupled to the image
output port;~~

the photographing device exposes and forms the image
of the observation sample onto a film surface thereof;

the TV camera photographs the image of the observation sample by a photographing element thereof and outputs image data thereof;

the digital camera device photographs the image of the observation sample and records the image data as a still image on a recording medium; and

at least a first camera and a second camera are attachable to the microscope main body,
the photographing device comprising:

a light path switching mechanism that guides an image formation light flux from the microscope main body to at least one of the first camera and the second camera;

a photographing shutter arranged in a light path of the image formation light flux in a light incoming side of the light path switching mechanism; and

shutter mechanisms arranged in the light path toward the first camera side split by the light path switching mechanism, and blocking the light flux on the light path in synchronization with the switching actions of the light path switching mechanism.

Claim 11 (Cancelled).

Claim 12 (Currently Amended). ~~An~~ The inverted microscope according to claim ~~11~~ 10, wherein, in a state where the photographing shutter and the shutter mechanisms are closed, a first space and a second space are formed, the first space that includes part of the light path of the image ~~forming~~ formation light flux toward the first camera~~7~~ and is closed completely by the first camera and the shutter mechanisms, and

36 ~~a the~~ the second space ~~that~~ includes the light path of the image ~~forming~~ formation light flux toward the light path switching mechanism and the shutter mechanisms~~7~~ and is closed completely by the photographing shutter, ~~and~~ the shutter mechanisms and the second camera ~~are formed~~.

Claim 13 (Currently Amended). ~~An~~ The inverted microscope according to claim ~~11~~ 10, wherein the shutter mechanism ~~comprising~~ comprises:

a light path switching lever ~~for pulling and inserting operation, which pulls and inserts~~ a throttle plate, which that has an opening for ~~letting~~ passing the image ~~forming~~ formation light flux toward the first camera ~~go through~~, and moves to ~~the a~~ a position to ~~let~~ pass the image ~~forming~~ formation light flux ~~go through the opening~~ or to ~~the a~~ a position to block the image

~~forming~~ formation light flux, in synchronization with ~~to~~ the pulling and inserting operation of the light path switching lever;

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a an openable and closable mechanical shutter main body having that is formed in a size sufficient to block the image formation light flux through the opening, and can open and close the opening; and

a link mechanism ~~for moving~~ which moves the mechanical shutter main body to the position to close the opening before the throttle plate blocks the image ~~forming~~ formation light flux in synchronization with the movement of the throttle plate.

Claim 14 (Currently Amended). ~~An~~ The inverted microscope according to claim ~~11~~ 10, wherein said light path switching mechanism ~~comprising~~ comprises:

position detecting sensors that detect ~~to~~ which of the first camera or the second camera the image ~~forming~~ formation light flux from the microscope main body is guided; and

means ~~that makes~~ for enabling an operation of the photographing shutter ~~available~~ only when the position detecting sensors detect that the image ~~forming~~ formation light flux from

the microscope main body is guided to either the first camera or the second camera.

Claim 15 (Currently Amended). An inverted microscope ~~according to claim 10, comprising:~~

an image output port that forms an image of an observation sample to an external surface of a microscope main body, and is provided at an observer side and a front side of the microscope main body, and below a lens tube to which eyepieces are attached, wherein, and

at least one of a photographing device, a TV camera, and a digital camera device is selectively coupled/decoupled to the image output port,

the photographing device exposes and forms the image of the observation sample onto a film surface thereof,

the TV camera photographs the image of the observation sample by a photographing element thereof and outputs image data thereof; and

the digital camera device photographs the image of the observation sample and records the image data as a still image on a recording medium,

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the image formed on the image output port is an image that is reflected once by a reflection member provided to the microscope main body in a light path from the observation sample to the image output port in the light path for the image output port to the film surface of the photographing device, the reflection member, which generates odd-numbered times of reflection, provided in the photographing device, generates an odd-number of reflections for the image formation light flux, and

the image formed on the film surface of the photographing device is ~~a front~~ an image that is obtained by reflecting the light flux ~~reflected an even-numbered number of~~ times by a reflection member in the light path from the observation sample to the film surface, ~~by providing the reflection member in the photographing device and generates odd-numbered times of reflections in the light path from the image output port to the film surface.~~

Claim 16 (Currently Amended). An inverted microscope according to claim 15, wherein the image of the observation sample is formed at the position protruded by a specified distance from the image output port,

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and when attaching to the image output port one of the photographing device, the TV camera, and the digital camera device, a photographing lens unit ~~corresponding to any of the photographing device to the image output port, the TV camera, and the digital camera device,~~ among plural photographing lens units having different photographing magnifications, is assembled into the end surface portion of the image output port in an attachable/detachable manner.

Claim 17 (Currently Amended). ~~An~~ The inverted microscope according to claim 16, further comprising plural photographing lens units having different photographing magnifications respectively in accordance with the photographing device, the digital camera device, and the TV camera,

and one of the plural photographing lens units is selected ~~assembled therein~~ according to the kind of the photographing device, the TV camera, and the digital camera device.

Claims 18-20 (Cancelled).

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Claim 21 (Withdrawn). An inverted microscope comprising:

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an image forming optical system including objective lenses arranged below an observation sample placed on a stage of a microscope main body;

an optical element which forms an image of the observation sample at the position where an image forming light flux obtained by the image forming optical system is polarized to an observer side from the optical axis of the objective lens;

photographing means for photographing an image of the observation sample;

an image recording section configured to record image signals photographed by the photographing means; and

display means attached to the surface facing to the observer at the front of the microscope main body, for displaying images photographed by the photographing means.

Claim 22 (Withdrawn). An inverted microscope according to claim 21, wherein the display angle of the display means is variable.

Claim 23 (Withdrawn). An inverted microscope according to claim 21, further comprising:

a light path splitting means for splitting the light path of an image of an observation sample formed by the image forming optical system;

a relay optical system for guiding to an eyepiece the light flux from an observation sample of one light path split by the light path splitting means; and

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(m) a photographing optical system set to a specified contraction magnification for guiding to the photographing means the light flux from an observation sample of the other light path split by the light path splitting means.

Claim 24 (Withdrawn). An inverted microscope according to claim 23, wherein the display angle of the display means is variable.

Claim 25 (Withdrawn). An inverted microscope according to claim 15, wherein said photo photographing device can attach at least a first camera and a second camera to a microscope main body, further comprising:

a light path switching mechanism that guides an image forming light flux from the microscope main body to at least one of the first camera and the second camera;

a photographing shutter arranged in a light path of the image forming light flux in the light incoming side than the light path switching mechanism; and

shutter mechanisms that are arranged in the light path toward the first camera side split by the light path switching mechanism, and block the light path in synchronization with the switching actions of the light path switching mechanism.

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Claim 26 (Withdrawn). An inverted microscope according to claim 25, wherein, in a state where the photographing shutter and the shutter mechanisms are closed, a first space that includes part of the light path of the image forming light flux toward the first camera, and is closed completely by the first camera and the shutter mechanisms, and a second space that includes the light path of the image forming light flux toward the light path switching mechanism and the shutter mechanisms, and is closed completely by the photographing shutter and the shutter mechanisms and the second camera are formed.

Claim 27 (Withdrawn). An inverted microscope according to claim 25, wherein the shutter mechanism comprising:

a light path switching lever for pulling and inserting operation;

a throttle plate that has an opening for letting the image forming light flux toward the first camera go through, and moves to the position to let the image forming light flux go through the opening or to the position to block the image forming light flux, in synchronization with to the pulling and inserting operation of the light path switching lever;

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a mechanical shutter main body that is formed in a size at least enough to block the opening, and can open and close the opening; and

a link mechanism for moving the mechanical shutter main body to the position to close the opening before the throttle plate blocks the image forming light flux in synchronization with the movement of the throttle plate.

Claim 28 (Withdrawn). An inverted microscope according to claim 25, wherein said light path switching mechanism comprising:

position detecting sensors that detect to which of the first camera or the second camera the image forming light flux from the microscope main body is guided; and

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means that makes the photographing shutter available only when the position detecting sensors detect that the image forming light flux from the microscope main body is guided to either the first camera or the second camera.

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Claim 29 (Withdrawn). An inverted microscope according to claim 21, wherein the contraction magnification of the photographing system is so set that the magnification of the image of the observation sample displayed by the display means should be equal to the magnification of the image of the observation sample observed by the eyepieces.

Claim 30 (Withdrawn). An inverted microscope according to claim 21, wherein when displaying the image photographed by the photographing means by the display means, a signal processing portion having an electronic zoom function for magnifying the image by an optional magnification is arranged,

and the contraction magnification of the photographing optical system (β) is made so that the area of the image photographed by the photographing means should be almost equal to the area observed by the eyepieces ($\beta \approx K/FN$, when the width across of the photographing element is set as K, and the number

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of views of the eyepieces is set as FN), and the magnification of the electronic zoom is made variable, thereby the magnification of the image of the observation sample displayed by the display means can be made equal to the magnification of the image of the observation sample observed by the eyepieces.

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Claim 31 (Withdrawn). An inverted microscope according to claim 30, further comprising: means for storing plural magnifications of the image of the observation sample displayed by the display means changed by the electronic zoom function; and means for setting the magnification of the image of the observation sample displayed by the display means to an optional magnification.

Claim 32 (Withdrawn). An inverted microscope according to claim 23, wherein the contraction magnification of the photographing system is so set that the magnification of the image of the observation sample displayed by the display means should be equal to the magnification of the image of the observation sample observed by the eyepieces.

Claim 33 (Withdrawn). An inverted microscope according to claim 23, wherein when displaying the image photographed by the photographing means by the display means, a signal processing portion having an electronic zoom function for magnifying the image by an optional magnification is arranged,

and the contraction magnification of the photographing optical system (β) is made so that the area of the image photographed by the photographing means should be almost equal to the area observed by the eyepieces ($\beta \approx K/FN$, when the width across of the photographing element is set as K, and the number of views of the eyepieces is set as FN), and the magnification of the electronic zoom is made variable, thereby the magnification of the image of the observation sample displayed by the display means can be made equal to the magnification of the image of the observation sample observed by the eyepieces.

Claim 34 (Withdrawn). An inverted microscope according to claim 33, further comprising: means for storing plural magnifications of the image of the observation sample displayed by the display means changed by the electronic zoom function; and means for setting the magnification of the image of the

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observation sample displayed by the display means to an optional
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